This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS

-1-(Previously Amended)

A mesostructured crystalline hydrated alumina composition and consists essentially of boehmite with atomically ordered crystalline framework walls forming mesopores, without amorphous hydrated alumina, and exhibiting at least one low angle x-ray diffraction line corresponding to a lattice spacing of at least 2.0 nm and multiple wide angle x-ray diffraction lines with CuKα radiation wherein λ is 0.1541 nm and the boehmite particularly has characteristic 2θ/° diffraction lines of the multiple wide angle lines as shown in Figures 2 and 5 marked "As-made" and 7B marked "MSU-S/B" corresponding to an ordered lattice comprised of oxygen atoms and hydroxide groups with aluminum in interstitial positions within the lattice, wherein the surface area is at least 200 m^2/g; and wherein the pore volume is at least 0.40 cm^3/g, wherein the boehmite is formed by mixing a precursor amorphous hydrated alumina and an organic modifier which forms the mesostructure and then heating the mixture so that the boehmite is completely formed and then removing water and the organic modifier to provide the composition which can be calcined to form a transition alumina.

Claim 2 (Cancelled)

-3-(Previously Amended)

A mesostructured crystalline hydrated alumina composite composition with mesopores containing an organic modifier in the mesopores of the alumina wherein the alumina composition consists essentially of boehmite with atomically ordered crystalline framework walls forming mesopores, without amorphous hydrated alumina, and when the organic modifier is removed exhibits at least one low angle x-ray diffraction line corresponding to a lattice spacing of at least 2.0 nm and multiple wide angle x-ray diffraction lines and the boehmite particularly has characteristic 2θ/° diffraction lines of the multiple wide angle lines as shown in Figures 2 and 5 marked "As-made" and 7B marked "MSU-S/B" as made corresponding to an ordered lattice comprised of oxygen atoms and hydroxide groups with aluminum in interstitial positions within the lattice, wherein the boehmite is formed by mixing a precursor amorphous hydrated alumina and the organic modifier which forms the mesostructure and then heating the mixture so that the boehmite is completely formed to provide the composition, wherein when the organic modifier is removed, the composition can be calcined to form a transition alumina.

-4-(Previously Amended)

The composition of Claim 3 wherein the organic modifier is a non-ionic surfactant.

-5-(Previously Amended)

The composition of Claim 4 wherein the surfactant is selected from the group consisting of a polyethylene oxide block co-polymer, an alkylene amine; an alkylene polyamine, a polypropylene oxide amine, a polypropylene oxide polyamine and mixtures thereof.

-6-(Previously Amended)

The composition of any one of Claims 3, 4 or 5 wherein the hydrated alumina component is boehmite.

-7- (Previously Amended)

A mesostructured crystalline transition alumina composition comprising gamma alumina and:

wherein the composition exhibits at least one low angle x-ray diffraction line corresponding to a lattice spacing of at least 2.0 nm and derived from a boehmite with atomically ordered crystalline framework walls forming mesopores, without amorphous hydrated alumina, with multiple wide angle x-ray diffraction lines with CuKα radiation wherein λ is 0.1541 nm and the boehmite particularly has characteristic 2θ/° diffraction lines of the multiple wide angle lines as shown in Figures 2 and 5 marked "as-made" and 7B marked "MSU-S/B" as made corresponding to an ordered oxygen atom lattice with aluminum in interstitial positions within the lattice, wherein the surface area is at least 200 m^2/g; and wherein the pore volume is at least 0.40 cm^3/g, wherein the boehmite is formed by mixing a precursor amorphous hydrated alumina with an organic modifier which forms the mesostructure, heating the solution so that the boehmite is completely formed, then removing water and the organic modifier from the mesostructured boehmite, and then calcining the mesostructured boehmite to form the gamma alumina composition.

-8- (Previously Amended)

The mesostructured transition alumina of Claim 7 wherein the transition alumina consists essentially of gamma alumina.

Claims 9 - 26 (Cancelled)